International Poster Journal IPJ of Dentistry and Oral Medicine

Int Poster J Dent Oral Med 2006, Vol 8 No 01, Poster 305

Herbal extracts as adjunct in supportive periodontal therapy

Language: English

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Date/Event/Venue:
09.09.2004
Jubiläumstagung der Deutschen Gesellschaft für Parodontologie e.V. (DGP) zum 80. Jahrestag der Gründung der ARPA gemeinsam mit der GZMK Dresden e.V.
Dresden

Introduction

Centella asiatica and Punica granatum are medicinal plants that have been reported to promote tissue healing and modulate host responses. Preliminary study (11) revealed positive clinical effects of an innovative preparation from the two herbal extracts in the form of biodegradable chips as a subgingival adjunct to scaling and root planing.

Fig. 1 Centella asiatica

Fig. 2 Punica granatum

Objectives

The purpose of this research was to evaluate further augmenting efficacy the combined herbal preparation may have among maintenance patients in comparison to standard supportive periodontal therapy (SPT), with additional monitoring of certain inflammatory markers.

Material and Methods

Fifteen patients in the recall programme who had completed conventional periodontal therapy with remaining probing pocket depth 5-8 mm were enrolled. After baseline examination and collection of gingival crevicular fluid (GCF) samples, SPT was provided and the target teeth in the test group received subgingival delivery of the medicated chips (Fig. 3). The clinical parameters which included probing pocket depth (PD), attachment level (AL), bleeding index (BI), gingival index (GI) and plaque index (PI) were recorded and GCF samples were collected at baseline, 3 and 6 months (Table 1) for analysis of immunological mediators using enzyme link immunosorbent assay (ELISA).

Fig. 3 Subgingival delivery of medicated chip

Fig. 4 GCF collection

Visit	Procedures
Screening exam	PD, case selection, randomization
Baseline	PD, AL, BI, GI, PI, GCF, SPT, chips
3. month follow-up	PD, AL, BI, GI, PI, GCF, SPT, chips
6. month follow-up	PD, AL, BI, GI, PI, GCF, SPT

Table 1: Summary of clinical procedures

Results

The results showed significant improvement of PD, AL, GI at 3 and 6 months (Fig. 5-7) and BI at 6 months in the test group compared to control. No significant differences in PI were found between the two treatment modalities at all subsequent visits. The test group also showed statistically greater reduction of IL-1ß at both 3 and 6 months and lower IL-6 concentration which almost reached significant level at 6 months (Table 2).

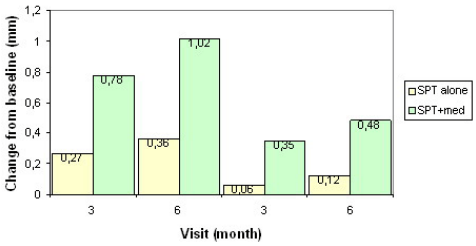


Fig. 5 PD & AL improvement at 3 and 6 months for all PD

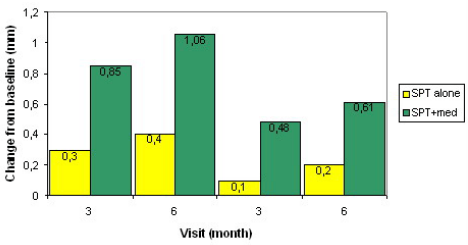
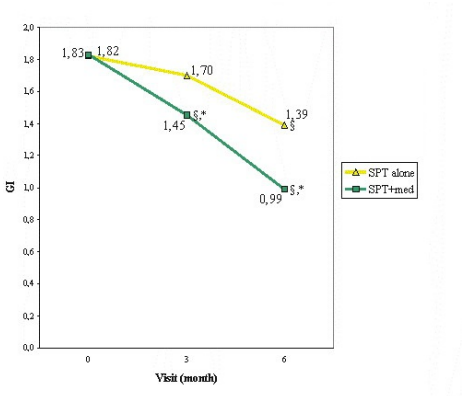


Fig. 6 PD & AL improvement at 3 and 6 months for initial PD 7-8 mm



§ Statistically significant compared to baseline.
* Statistically significant compared to SPT alone

Fig. 7 Changes in mean GI at 3 and 6 months

Treatment	IL-1β (pg/µl)			*p*-value		IL-6 (pg/µl)			*p*-value	
	0	3	6	0-3	0-6	0	3	6	0-3	0-6
SPT alone	31.81±8.26	19.51±5.87	13.56±3.61	0.349	0.105	2.01±0.52	0.48±0.15 §	0.38±0.16 §	0.006	0.003
SPT+med	49.91±5.63	19.96±3.55 §	13.47±2.05 §	< 0.001	< 0.001	1.49±0.28	0.19±0.07 §	0.04±0.03 §	< 0.001	< 0.001
p-value	0.102	0.949	0.983	-	-	0.386	0.078	0.055	-	-

Table 2: Mean SD of IL-1ß and IL-6 levels at baseline, 3 and 6 months

Study	Duration (months)	Treatment	Mean initial PD (mm)	Mean PD reduction from baseline (mm)	Mean AL reduction from baseline (mm)
1.Stelze&Floresde-Jacoby (1997)	6	SRP alone	5.57	1.50	-
		metronidazole alone	5.65	1.32	-
2.Rudhart et al. (1998)	6	SRP alone	5.7	1.6	0.5
		metronidazole alone	5.8	1.6	0.7
3.Garrett et al.		SRP alone	5.9	1.1	0.8

(2000)	9	doxycycline alone	5.9	1.3	0.7
4.Heasman et al. (2001)	6	SRP alone	6.47	0.45	0.15
		SRP+CHX chip	6.64	0.78	0.43
5.He et al. (2001)	6	SRP alone	-	0.77	0.40
		SRP+CHX chip	-	1.32	0.94
6.Sastravaha et al. (2004)	6	SPT alone	6.21	0.36	0.12
		SPT+med	6.39	1.02	0.48

Table 3: Mean PD&AL improvement from clinical trials employing different local adjunctive agents in supportive periodontal therapy

Conclusions

1. The clinical improvement in SPT+med was confirmed by immunological mediator analysis. Together with other reports (7, 11, 12), the results from this study indicate that additional benefits may be obtained by utilizing certain botanically derived substances as adjunct in standard periodontal therapy.
2. In contrast to the anti-infective phase, local antimicrobial delivery has not been widely used in maintenance patients. Some information, however, are summarized in Table 3 to allow comparison with other investigations (3, 5, 6, 10, 13). It may seem that SPT+med in the present trial yielded slightly less PD and AL. Partially, this may be due to the different kinds of adjunctive agents themselves. In addition, the method used in each study and inconsistence in the mean initial PD have to be taken into consideration as changes in PD or AL may differ between therapies (4). In this study, scaling and root planing was not included and the mean initial PD was also somewhat greater than those of most other reports.
3. Presence of bleeding on probing is a good indicator to indicate presence of inflammation (9). SPT+med showed significantly better BI at 6 months and GI at 3 and 6 months. This reflects the capability of the herbal chips in reducing degree of inflammation and improving gingival health. PI, on another hand, was clearly seen as being independent from the treatment modalities with no significant differences at any time points.
4. The use of local delivery systems with antimicrobials will not replace the necessity of scaling and root planing (8). Repetitive mechanical debridement, however, may result in loss of attachment (1) and tooth structure (16), possibly followed by dentin sensitivity (14). Moreover, patient compliance with maintenance visits is usually poor (15). Some patients also consider periodontal instrumentation to be too traumatic and less invasive alternatives would therefore be welcome (2). According to the above argument, local delivery with herbal extracts may serve as a reasonable compromised strategy to substitute mechanical instrumentation at some recall appointments and represent a new alternative for adjunctive agents, especially when selection of drugs in the antibiotic or NSAID classes is contraindicated or undesirable.
5. Although the present study provided quite positive results which support a previous study (11), they are sufficient to answer questions to a certain extent. Adjustment of the methodology may be considered in a future trial including increasing the sample size for better extrapolation of the results. Extending the duration of follow-up period may also enable detection of further changes over time at both clinical and subclinical levels.

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This Poster was submitted by Dr. Grindwit Sastravaha.

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Poster Faksimile:

HERBAL EXTRACTS AS ADJUNCT IN SUPPORTIVE PERIODONTAL THERAPY

Poster No. 38

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Background and aim:

Centella asiatica and *Punica granatum* are medicinal plants that have been reported to promote tissue healing and modulate host responses. Preliminary study (11) revealed positive clinical effects of an innovative preparation from the two herbal extracts in the form of biodegradable chips as a subgingival adjunct to scaling and root planing. The purpose of this research was to evaluate further augmenting efficacy the combined herbal preparation may have among maintenance patients in comparison to standard supportive periodontal therapy (SPT), with additional monitoring of certain inflammatory markers.

Materials and methods:

Fifteen patients in the recall programme who had completed conventional periodontal therapy with remaining probing pocket depth 5-8 mm were enrolled. After baseline examination and collection of gingival crevicular fluid (GCF) samples, SPT was provided and the target teeth in the test group received subgingival delivery of the medicated chips (Fig. 3). The clinical parameters which included probing pocket depth (PD), attachment level (AL), bleeding index (BI), gingival index (GI) and plaque index (PI) were recorded and GCF samples were collected at baseline, 3 and 6 months (Table 1) for analysis of immunological mediators using enzyme link immunosorbent assay (ELISA).

Results:

The results showed significant improvement of PD, AL, GI at 3 and 6 months (Fig. 5-7) and BI at 6 months in the test group compared to control. No significant differences in PI were found between the two treatment modalities at all subsequent visits. The test group also showed statistically greater reduction of IL-1ß at both 3 and 6 months and lower IL-6 concentration which almost reached significant level at 6 months (Table 2).

Discussion:

1. The clinical improvement in SPT+med was confirmed by immunological mediator analysis. Together with other reports (7, 11, 12), the results from this study indicate that additional benefits may be obtained by utilizing certain botanically derived substances as adjunct in standard periodontal therapy.

2. In contrast to the anti-infective phase, local antimicrobial delivery has not been widely used in maintenance patients. Some information, however, are summarized in Table 3 to allow comparison with other investigations (3, 5, 6, 10, 13). It may seem that SPT+med in the present trial yielded slightly less PD and AL. Partially, this may be due to the different kinds of adjunctive agents themselves. In addition, the method used in each study and inconsistence in the mean initial PD have to be taken into consideration as changes in PD or AL may differ between therapies (4). In this study, scaling and root planing was not included and the mean initial PD was also somewhat greater than those of most other reports.

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5. Although the present study provided quite positive results which support a previous study (11), they are sufficient to answer questions to a certain extent. Adjustment of the methodology may be considered in a future trial including increasing the sample size for better extrapolation of the results. Extending the duration of follow-up period may also enable detection of further changes over time at both clinical and subclinical levels.

Fig. 1 *Centella asiatica*

Fig. 2 *Punica granatum*

Fig. 3 Subgingival delivery of medicated chip

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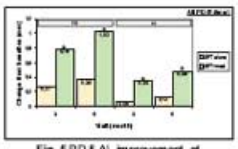
Fig. 4 GCF collection



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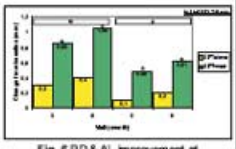

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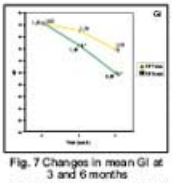

Fig. 7 Changes in mean GI at 3 and 6 months

	IL-1ß (pg/l)			p-value		IL-6 (pg/l)			p-value	
Subject	1	2	3	b3	b6	1	2	3	b3	b6
SPT alone	0.0§	0.0§	0.0§	n/a	n/a	0.0§	0.0§	0.0§	n/a	n/a
SPT+med	0.0§	0.0§	0.0§	n/a	n/a	0.0§	0.0§	0.0§	n/a	n/a
p-value	n/a	n/a	n/a	-	-	n/a	n/a	n/a	-	-

Table 2 Mean±SD of IL-1ß and IL-6 levels at baseline, 3 and 6 months

§ Statistically significant compared to baseline
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Study	Duration (months)	Treatment	Mean initial PD (mm)	Mean PD reduction from baseline (mm)	Mean AL reduction from baseline (mm)
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		doxycycline alone	5.9	1.3	0.7
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		SPT+med	6.39	1.02	0.46

Table 3 Mean PD&AL improvement from clinical trials employing different local adjunctive agents in supportive periodontal therapy

Conclusion:

Together with the results from a previous research, it was concluded that with the use of the adjunctive herbal medicament from combined extracts of *Centella asiatica* and *Punica granatum* pericarp, improvement in clinical signs of chronic periodontitis can be augmented not only in the initial treatment, but also in the maintenance phase.

Acknowledgement:
-Deutscher Akademischer Austausch Dienst (DAAD) & Forschungsgemeinschaft Dental (FGD)
-Dr. David Barrow, Lab Manager, Center for Oral & Systemic Diseases (COSD), University of North Carolina at Chapel Hill, U.S.A.

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